Diskussionsschriften

The Impact of In-Work Benefits on Poverty and Household Labour Supply
A simulation study for Switzerland

Michael Gerfin
Robert E. Leu

03-04

April 2003

Universität Bern
Volkswirtschaftliches Institut
Gesellschaftstrasse 49
3012 Bern, Switzerland
Tel: 41 (0)31 631 45 06
Web: www.vwi.unibe.ch

The Impact of In-Work Benefits on Poverty and Household Labour Supply

A simulation study for Switzerland

Michael Gerfin

University of Bern and IZA, Bonn

Robert E. Leu

University of Bern

This version: 28 April 2003

Abstract

Income support for working low income families (the "working poor") is on top of the political agenda in Switzerland. The current social assistance system is considered inadequate to support working poor households. Labour unions propose the introduction of a general minimum wage, whereas the Swiss government promotes in-work benefits. Based on a structural labour supply model this paper provides microsimulation results of the effects of introducing different schemes of in-work benefits. It turns out that adding a minimum hours requirement to the current social assistance system is the most cost-efficient reform. Minimum wages are ineffective in fighting poverty.

Keywords: Tax Credits, Household Labour Supply, Microsimulation, Poverty

JEL I38, J22, C25

Corresponding author:

Michael Gerfin
Volkswirtschaftliches Institut
Universität Bern
Gesellschaftsstr. 49
CH 3012 Bern
Switzerland
michael.gerfin@vwi.unibe.ch

Acknowledgements: This paper is part of an evaluation study of policy reforms to fight poverty among the working population, commissioned by the Swiss State Secretariate of Economics (seco). The views expressed in this paper are those of the authors and not necessarily those of the seco. Stefan Brun and Andreas Tschöpe provided excellent reseach assistance. We thank Aymo Brunetti and Boris Zürcher (seco) for many helpful discussions. A preliminary version of the paper has been presented at the IZA workshop on the Future of Family and Work (May 2002) and at the Panel of Population Economics of the Verein für Socialpolitik in Berlin, February 2003. We thank Thomas Bauer, Michael Lechner, and participants for helpful comments.

1. Introduction

In many European countries in-work benefits are either already implemented (e.g. UK, Ireland, Belgium) or discussed as a possible reform of the existing income support schemes (see Gradus und Julsing, 2000, for a recent survey). In-work benefits are characterised by making eligibility conditional on working. In most cases benefit reduction rates are smaller than 100% in order to make work pay. Switzerland, like Germany, still has an income support system characterised by implicit marginal tax rates of 100% (or above), thus lacking any work incentive for the recipients. This kind of income support system provides a guaranteed minimum income. There is a major difference between the German and the Swiss case, however. Switzerland has a much less severe unemployment problem compared to Germany. Hence, the main task for Swiss policy makers is not getting the unemployed back to work but supporting the low-income workers (the so-called "working poor"). Currently, the working poor are eligible for social assistance, but there is consenus that the current social assistance system is not adequate and not designed to support the working poor. The labour unions propose a (relatively high) general minimum wage as a solution. There is clear empirical evidence, however, that a minimum wage is not an useful instrument to fight poverty (see e.g. Neumark and Wascher, 1997). Hence, other instruments have to be considered, in particular in-work benefits similar to the Earned Income Tax Credit (EITC) in the USA or the British Working Families Tax Credit (WFTC). These two programmes differ in many details, but the underlying principles are the same. Families with low incomes receive tax credits given that at least one family member works. The WFTC also has a minimum hours requirement (16 hours per week).

In this paper we perform microsimulations in order to assess the expected effects and costs of introducing in-work benefits in Switzerland. We analyse two tax credit systems: the first simply supplements the existing social assistance rules by a minimum hours requirement (guaranteed minimum income given positive labour supply). Households that are eligible for this tax credit face an implicit marginal tax rate of 100% for additional labour income. The second tax credit is designed as the British WFTC, with parameters adjusted to Swiss standards. The main difference between these two designs is that the first will increase each recipient household's income exactly to the poverty line, and no household above the poverty line receives a tax credit. By contrast, the second design will leave some recipient households below the poverty line, and households above the poverty line may also receive a tax credit, given their income is below the

threshold defined by the parameters of the system. For comparison purposes we also simulate the expected effects of introducing a general minimum wage as demanded by the labour union. These simulations are based on the estimates of a structural household labour supply model. Not surprisingly, our results clearly indicate that tax credits are much more effective in supporting low-income households than minimum wages.

The paper is organised as follows: the next section describes the Swiss benefit and tax system, the income distribution and poverty as well as labour supply in the year 1998. Section 3 develops a structural labour supply model for one and two-adult households. The data used in this paper are briefly described in section 4. Estimation results are discussed in section 5, and section 6 contains simulation results for several policy reforms. Section 7 concludes.

2. Social Assistance, Poverty, and Labour Supply in Switzerland

This section provides a description of the current benefit and tax system in Switzerland, family labour supply and the income distribution in Switzerland, with special emphasis on poverty.

2.1 The Swiss Benefit and Tax System

Benefits

Apart from unemployment insurance the main component of the Swiss benefit system for the working age population is the so-called “Sozialhilfe” (Social Assistance). The Swiss Conference for Social Assistance[1] publishes guidelines defining minimal subsistence incomes differentiated by family size. Table 1 displays the current guidelines and their implicit equivalence scales. It is important to note that housing expenditure and sickness fund premia are not included in the subsistence level. These are reimbursed separately according to actual expenditure, up to some maximum. The final two columns display the poverty lines used in this study. They are constructed by adding median family size specific housing expenditure to the SKOS guidelines. The housing expenditure are computed using households with disposable income below median income, separated by household size and region. To compute poverty rates actual sickness fund premia as recorded in the data are subtracted from disposable income.

1 Schweizerische Konferenz für Sozialhilfe, SKOS.

The SKOS guidelines are not mandatory. Each canton has its own social assistance regulations with different eligibility criteria, income thresholds, and levels of benefits. The basic structure is the same across all cantons, however: given eligibility, families receive the difference between their income and the threshold with an implicit marginal tax rate of 100% on additional earnings. Hence the current system has negative labour incentives. This problem has recently been acknowledged by policy makers and several cantons are planning a reform of the welfare system.[2] In 1998 total expenditure for social assistance were approximately 2 billion CHF. This accounts for roughly 2% of total social security expenditure and for 0.5% of GDP.

There appears to be a general consensus that the current social assistance is not an adequate instrument for income support of working low income households. Social assistance was originally designed as a temporary aid for families in financial emergencies. However, in the past social assistance became a long-term welfare instrument in many cases. Introducing tax credits may help to focus social assistance on its original purpose. Another point relates to stigma effects. There is evidence that take-up is relatively low (c.f. Leu et al., 1997). Apart from stigma it may be difficult for full-time working persons to fulfill the obligations necessary to receive social assistance. Applicants for social assistance have to register with the social assistance administration and to report their financial situation periodically. Finally, some eligible working persons may not be aware of their eligibility. Tax credits do not have these problems; tax records are collected anyway, and the tax office can inform eligible persons about their tax credit (or simply deduct the tax credit from the tax bill). Hence it is to be expected that take-up will be much higher because there is less stigma and less administrative hurdles and costs.

Taxes

The main feature of the Swiss tax system is that federal taxes are only a minor component of total tax payments. The majority consists of cantonal and communal taxes that vary considerably across cantons and communities. Marginal tax rates are low compared to most European countries. The maximum marginal tax rates (including federal taxes) vary between 25% and 43%. Within cantons communities set the communal taxes as a percentage of cantonal taxes. These tax factors vary between 0.5 and 2. Couples can only file jointly. Hence secondary earners face relatively high marginal tax rates. This problem is alleviated to some extent by lower tax rates for

2 The canton of Basel-Stadt introduced the new welfare legislation in January 2002, which reduced the reduction rate of welfare payments to 66%.

couples, but there is still a marriage penalty with respect to income taxation. In general there is a deduction for children reducing taxable income. Again, this deduction varies considerably across cantons (between CHF 2'500 and CHF 6'000 per child). In one canton there is a deduction from taxes of CHF 400 per child. Child care expenditure are deductible in 11 cantons, but the conditions are rather restrictive (e.g. inability to work of one parent). In 13 cantons single parents are taxed according to the lower tax rates for married couples. In addition 22 cantons allow a deduction from the lower income if both partners work. Single parents are also eligible for this deduction. Again, these deductions vary considerably across cantons.

This brief discussion highlights the fact that there is no "Swiss" tax system, but 26 different tax systems. Within these 26 tax systems taxes vary according to the communal tax rate. This complicates the analysis considerably. Our estimation and simulation model requires a tax-benefit model to compute expected taxes and benefits. Given the complexities of the Swiss tax system we utilised a simplified tax-benefit model. We apply the tax factor of each canton's capital to everyone living in the respective canton.[3] Cantonal and federal taxes are computed according to the published tax tables. Communal taxes are the capital's tax factor times cantonal taxes.

2.2 Income Distribution and Poverty

The primary focus of the present study is on the low income working households. The public discussion focusses on the "working poor", usually without explicitly defining the concept of working poor. In this study a household is considered poor if its disposable income net of sickness fund premia is below the poverty line described in section 2.1. A household is working poor if total household labour supply is at least 40 hours per week and the household is poor as defined above.[4] The drawback of this definition is that households who cannot work full-time for some reason are not considered as working poor. This is typically the case for single parents. Hence we also consider poverty among households with at least 50% employment and with at least 1 hour employment. Looking at the public debate there seems to be a consensus that apart from single parent households it is reasonable to require full-time work in order to qualify as a working poor household in Switzerland.

3 According to the Federal Tax Office this is a good approximation because in general the principal's tax factor is close to the cantons average tax factor.

4 We measure poverty on the household level because the poverty line is based on minimal subsistance levels differentiated by household size.

Poverty rates are displayed in Table 2. The base population consists of households with the household head neither retired nor self-employed[5], where the household head is the person contributing the majority to household income. Of course, there should be no poverty if take-up were 100% and all cantons followed the SKOS guidelines. Obviously, this is not the case, for the reasons discussed in the previous section. The poverty rate in the base population is 4.9%, drops to 3.5% when only working households are considered and to 2.2% when only full-time working households are considered. In a large majority of the non-working poor households the household head is unemployed. The poverty rates differentiated by household type exhibit the expected pattern. Poverty is largest among single parent households, and above average for households with children as well. It is obvious how poverty is decreasing both in absolute as well as in relative terms when the hours requirement is increasing. About 75% of the working poor households with less than 40 hours are one-adult households, mostly single parents.

Table 2 also provides some information on income inequality. The inequality index belongs to the family of General Entropy measures, with inequality aversion parameter $\alpha = -1$. This index is sensitive to relative changes at the bottom of the income distribution. The pattern of inequality is very similar to the poverty pattern. Inequality decreases when the work requirement is increased. Interestingly, inequality is lowest among couples with children.

Further descriptive analysis reveals two important findings: only about 40 percent of the main earners in the working poor population receive wages below the minimum wage demanded by the labour unions. This number clearly indicates that a general minimum wage of CHF 3000 will not be very effective in reducing poverty among the working households. The second finding is that increasing the poverty line by 10% would double both the poverty and the working poor rate. In other words, there are as many households being at risk of becoming poor as there are poor households. In-work benefits are often designed to also increase incomes of households above the poverty line and thus reduce the poverty risk of these households.

5 We suspect that the income data for the self-employed are problematic because measuring self-employment income is difficult, given that private and company income and expenditure are often highly entangled. Consequently, reported income is a bad measure for the household's true financial situation. In addition, income data are not as detailed for the self-employed. In many cases the data contain only information on household income but not on the individual contributions to household income, making it impossible to compute individual wages (which are necessary for the labour supply model). Finally, when using monthly expenditure as the measure for welfare we find much smaller differences in the poverty rates of employed and self-employed households. Hence we decided to exclude self-employed households (i.e. households with the primary earner in self-employment) from the analysis.

2.3 Labour Supply

Figure 1 displays the distribution of hours worked for single men and women as well as for men and women in couples (excluding self-employed households). These figures clearly reveal that married women are the only group with notable heterogeneity in hours worked. The percentage of part-time working women is large in international comparison (roughly 50%). Single women are to a little degree more often in part-time work than single men, who in turn have a higher percentage of part-time workers than men in couples. The figures also show that the modes of the distributions are at working hours above 40 hours, reflecting the fact that usual working hours in Switzerland are roughly 42 hours per week. Household labour supply in Switzerland is still dominated by the traditional system of a full-time working husband. Based on these distributions we restricted hours choices of men to nonparticipation, part-time (24 hours) and full-time (42 hours). Women are assumed to have the choice in the set {0,8,16,24,32,42} of possible working hours.

3. A Structural Model of Family Labour Supply

The simulation of labour supply and income effects of hypothetical policy reforms requires a structural family labour supply model. Due to the complexities of the Swiss tax system and in order to simplify the construction of hypothetical budget constraints arising from the introduction of in-work benefits the model is set up as a discrete choice model. Hence we assume that the labour supply decision can be described as the utility maximising choice between discrete hours alternatives. For two-adult families the choice is between all combinations of possible labour supply states of each spouse. For each combination we have to compute the corresponding expected family income. We assume that the family maximises a joint utility function with family income and each spouse's labour supply as arguments. Specifically,

$$U = U(Y_{\{H_m, H_f\}}, T - H_m, T - H_f; X), \tag{1}$$

where Y is net household income, H_m and H_f are male and female hours of work, and X are household characteristics. Denoting gross wages as W_m and W_f and other household income as V, net income is given by

$$Y_{\{H_m, H_f\}} = W_m H_m + W_f H_f + V - T(\{H_m, H_f\}, \{W_m, W_f\}, V; X) \tag{2}$$

where $T(\{H_m, H_f\}, \{W_m, W_f\}, V; X)$ are tax payments.

Preferences over the hours choices are allowed to vary stochastically across individuals according to an extreme value distribution. The utility for some hours combination $H_{m(.)}H_{f(.)}$ can be written as

$$U^*_{H_{m(.)}H_{f(.)}} = U(Y_{\{H_{m(.)}H_{f(.)}\}}, T - H_{m(.)}, T - H_{f(.)}; X) + \varepsilon_{\{H_{m(.)}H_{f(.)}\}} \tag{3}$$

where $H_{i(.)}$ is a particular choice for individual *i* in the family. This implies that the probability that hours combination $\{H^j, H^k\}$ is preferred to all other combinations may be written as

$$\begin{aligned} \Pr\left[H_{m(.)} = H^j, H_{f(.)} = H^k\right] &= \Pr\left[U^*_{H^j,H^k} > U^*_{H^s,H^t}\right] \ \forall s \neq j, t \neq k \\ &= \frac{\exp\left[U\left(Y_{\{H^j,H^k\}}, T - H^j, T - H^k; X\right)\right]}{\sum_{s=1}^{J}\sum_{t=1}^{K}\exp\left[U\left(Y_{\{H^s,H^t\}}, T - H^s, T - H^t; X\right)\right]} \end{aligned} \tag{4}$$

where *J,K* denote the number of choice alternatives for husbands and wives, respectively.

Following van Soest (1995) and Blundell et al. (2000) we specify a quadratic utility function given by

$$\begin{aligned} U = {} & \alpha_{YY}Y^2 + \alpha_{H_mH_m}H_m^2 + \alpha_{H_fH_f}H_f^2 + \alpha_{YH_m}YH_m + \alpha_{YH_f}YH_f + \alpha_{H_mH_f}H_mH_f \\ & + \beta_Y Y + \beta_{H_m}H_m + \beta_f H_f \end{aligned} \tag{5}$$

Observed and unobserved heterogenetity is introduced by specifying

$$\begin{aligned} \beta_Y &= \beta_{y0} + v_Y \\ \beta_{H_m} &= \beta_{H_m 0} + \beta'_{H_m} X \\ \beta_{H_f} &= \beta_{H_f 0} + \beta'_{H_f} X, \end{aligned} \tag{6}$$

where $v_Y \sim N(0, \sigma_v)$. This specification turned out to be the best among a large variety of alternatives. The most general specification would be to make all β parameters a function of observed characteristics *X* plus an unobserved error term. However, once we control for observed heterogeneity in the β_H terms there was hardly any significant effect of *X* left in β_Y. Making all β parameters random yielded volatile estimates. Hence we chose the above specification with

observed heterogeneity in the β_H terms and unobserved heterogeneity in β_Y. This introduces considerably additional flexibility into the model and diminishes the impact of the extreme value assumption. Given these assumptions, conditional on v_Y and *X*, hours choices can be estimated by a multinomial logit model. The error term v_Y is incorporated by integrating the multinomial logit over its distribution, i.e.

$$\ell(\alpha, \beta \mid X) = \int_v \sum_j \sum_k d_{jk} \ln \Pr\left[H_{m(.)} = H^j, H_{f(.)} = k \mid X, v \right] f(v) dv, \qquad (7)$$

where *f(v)* is the density function of v_Y and $d_{jk} = 1\left[H_{m(.)} = H^j, H_{f(.)} = H^k \right]$.

As stated in the previous section we restrict hours choices of men to nonparticipation, part-time (24 hours) and full-time (42 hours). Women are assumed to have the choice in the set {0,8,16,24,32,42} of possible working hours. For one-adult households the model simplifies to the extent that only one hour choice has to be modeled, i.e. the set of possible hours is much smaller and the utility function is defined only on one labour supply dimension.

4. Data

The data used in this analysis come from the Swiss Income and Expenditure Survey 1998 (SIES). Over 9000 households participated in this survey conducted by the Swiss Federal Office of Statistics.[6] The main part and purpose of this survey consists of a detailed monthly expenditure diary. The expenditure include tax and social security payments. In addition, information on all sources of income as well as labour supply of each household member was collected. At the moment the SIES is the only Swiss dataset allowing to estimate family labour supply models. In addition, since expenditure is observed it is possible to estimate life-cycle consistent models of labour supply (cf. Blundell and MaCurdy, 1999).

In this analysis we concentrate on households in which the primary earner is employed or available for the labour market, i.e we drop households with heads who are self-employed (862), retired (2213), or in education (76). Furthermore, households with missing information on

6 The response rate was about 30%. Analyses using these data need to use population weights provided by the Statistical Office. Especially households with foreign heads not speaking one of the official Swiss languages are underrepresented in the SIES.

variables entering the model are deleted. The resulting sample sizes are 3485 for couples, 1174 single female and 831 single male households.

Table 3 displays descriptive statistics for the three samples. Single household heads are on average younger and better educated than the corresponding members of couple households. Single parents are in general female.

Wages are predicted using a standard wage regression (selectivity corrected in the case of women). Estimation results of the wage regressions are presented in Appendix Table B1. All estimates correspond to expectations. In order to have a clean stochastic specification of the model predicted wages are used for all observations, including the employed.

5. Estimation Results

Tables 4 and 5 display the estimation results for two adult and one-adult households, respectively. These estimates are difficult to interpret directly. From a theoretical point of view the coefficient of income squared must be negative in order to have decreasing marginal utility of income. Hence the coefficient of income, β_Y, must be positive for positive marginal utility of income at H=0. These restrictions are satisfied by the results. The random coefficient β_Y has strong heterogeneity, as can be seen by the rather large estimate of the standard deviation of the distribution of β_Y.

Regarding the parameters for hours it was not possible to estimate the coefficients of hours squared with any precision.[7] The coefficients of the heterogeneity components have to be interpreted as shifting marginal disutility of hours of work given income and partner's working hours in the case of couples. Hence a variable with negative coefficient increases the disutility of work. The estimates of the coefficients for the children related variables have the expected strong influence on the marginal disutility of work, especially for women in couples. Interestingly, marginal disutily of work for women in couples is smaller when either the woman herself or her partner have a high educational level. By contrast, men with a highly educated partner have higher disutilities of work. Overall, we find positive utilities of work for a rather large proportion of the sample.

7 Due to convergence problems the α_{HH} terms are set to zero for all groups except married women.

Overall, the fit of the estimated model is good. In particular, we do not observe the overprediction of part-time working women and underprediction of full-time working women, which has been found in other studies (e.g. van Soest, 1995).[8]

Table 6 shows the wage and income elasticities implied by the model. The elasticities are simulated by increasing wages and nonlabour income, respectively, by 10% and estimating the resulting changes in expected hours and participation rates. Participation rates are computed as the sample mean of the respective choice probabilities, expected hours are the sample mean of the choice probabilities times the hours values corresponding to the respective choices. Because the focus of the policy simulations is on low income households we present elasticities for the population of households with disposable income smaller than median income.

The message of Table 6 is rather straightforward. The only group with notable elasticities are women in couples. However, even for this group the estimated elasticities are rather low. A 1% increase in female wages increases female hours by roughly 0.5%. In fact, income effects are estimated to be almost as strong as the wage effects, with the cross wage elasticity being much more important than the nonlabour income elasticity. These findings suggest that the labour market effects of the simulated reforms are likely to be rather small. The corresponding elasticities for the entire sample are smaller in absolute values.

6. Simulation results

In this section we simulate several policy reforms aimed at increasing incomes of low income families. The simulation procedure is as follows: for each household we draw a vector of unobserved utility components ε from the extreme value distribution and a value for β_Y from the estimated distribution such that utility is maximised at the observed category, i.e. we place each household at its chosen point. We then modify incomes according to the proposed reforms and compute the new utility maximising choice. This yields estimates of the effects of the reforms on labour supply, household income, and costs. This exercise is repeated 10 times. The following results are the mean over the ten repetitions. This simulation approach has been proposed by Duncan and MacCrae (1999).[9] In all simulations we assume that only labour supply is affected by

[8] The corresponding figures are available on request.

9 Duncan and MacCrae (1999) note that the theory on applying discrete choice models of labour supply in microsimulations is underdeveloped. Neither aggregating choice probabilities over the sample nor applying the maximum probability rule are suited for microsimulations. The best way to proceed is to respect the probabilistic

the reforms. This is the common approach in this literature, but of course it is not entirely satisfactory. However, our data do not allow to model the labour demand side. We also assume that that all other programmes (especially social assistance) remain unchanged. However, given our design this implies that social assistance is as generous as the tax credit, but without the work requirement. This creates an incentive to stop working and to receive social assistance instead of the tax credit. However, these households did not receive social assistance before the introduction of the tax credits, so it is unlikely that they would do so when tax credits are introduced. We will come back to this point in the conclusions.

There are many ways to design in-work benefit systems. Possible role models are the Earned Income Tax Credit (EITC) in the USA and the Working Family Tax Credit (WFTC) in the UK. Both programmes are discussed in more detail in the Appendix. The main difference between the EITC and the WFTC is that the EITC has a wage subsidy component at low incomes (in the so-called phase-in region), whereas the WFTC replaces the phase-in region by a minimum working hours requirement of 16 hours per week.

There is a small theoretical literature on the optimal design of income support systems. Important contributions have been made by Besley and Coate (1992, 1995) and Saez (2002). The most relevant for this study is the paper by Besley and Coate (1995). In their analysis the optimisation problem for the government consists in minimising budgetary costs of ensuring that each individual obtains a minimum income level. Individuals differ in their income generating capabilities. Besley and Coate show that if the government could observe these capabilities it could design individual specific wage or income subsidies that minimise costs (the first-best solution). But the government usually cannot observe these capabilities. Besley and Coate show that in this case the optimal design depends on whether the government can implement work requirements (workfare). If not, a negative income tax is optimal, but budgetary costs are much larger compared to the first best situation. If workfare is possible a guaranteed income system supplemented by a work requirement is optimal.[10]

---

nature of the discrete choice model by basing the behavioural simulation on predicted choice probabilities. For a two-state model this is rather straightforward, but it is extremely difficult to extend the approach to higher dimensional problems (cf Duncan and Weeks, 1998).

[10] It should be noted that Besley and Coate refer to workfare as public work in addition to work in the private sector. We do not consider the case that the government has to provide public employment programmes. Instead, workfare means in our case that individuals have to be working in the private sector in order to be eligible for in-work benefits.

Saez (2002) analyses the effects of income support at the intensive (hours) and extensive (participation) margin of labour supply. He shows that if labour supply responses are concentrated along the intensive margin the optimal transfer programme is a negative income tax with a substantial guaranteed income support and a reduction rate. If labour supply resonses are concentrated along the extensive margin the optimal transfer programme is similar to the EITC with a negative marginal tax rate at low income levels and a small guaranteed income. His analysis is only for individuals, not for households with several potential earners. Introducing a work requirement in his model eliminates labour supply responses at the extensive margin. In this case, the predictions are very simular to Besley and Coate.

Extensive preliminary simulations[11] cleary indicate that the EITC does not appear to be an cost-effective instrument in Switzerland. The main reason is that the primary objective of the reform in the Swiss case is not getting people from welfare to work through a wage subsidy, but helping employed low income households. This suggests that variants of the WFTC are probably better suited for Switzerland. Again, extensive preliminary simulations confirm this conjecture (these preliminary simulations can be found in Gerfin et al., 2002). These findings correspond to the theoretical literature on the optimal design of income support systems.

There are many ways to design in-work tax credits with a minimum hours requirement. In the following we concentrate on two designs. The first Swiss Tax Credit for Working Families (TCWF) we evaluate is very close to the current welfare system. Each household below the poverty line will receive a tax credit such that the poverty gap will be closed. The only difference to the current system is that we impose hours requirements, either 40 or 20 hours per week. Note that this requirement refers to household labour supply, hence a household with two part-time working adults is eligible for the tax credit. This corresponds to the optimal design suggested by Besley and Coate (1995) when work requirement is possible.

The second TCWF is designed similar to the British WFTC. To do so we have to set three parameters: the maximum benefit, the threshold for the beginning of the phase-out, and the phase-out rate. Given that there is no concrete reform to be evaluated we are relatively free in choosing these parameters. However, these parameters should conform as much as possible with current Swiss practice. Hence, we set the phase-out rate equal to 70% because this the value currently discussed (and implemented in the canton Basel-Stadt) as a replacement of the 100%

[11] For these preliminary simulations we assumed that the reforms do not change behaviour.

implicit marginal tax rate on welfare payments. Furthermore, we set the income level at which the phase-out of the transfer starts equal for all households except for one-person households. Finally, following the current practice of the Swiss social assistance transfers are differentiated only by household size, thus giving children and adults equal weights in the implicit equivalence scales. In setting the maximum transfer level we use the SKOS guidelines (cf Table 1, column 2). Eligibility for the tax credit is conditional on working a specific amount of hours per week. Table 7 summarises the parameters for the Tax Credit for Working Families which we denote as TCWF 2.

The advantage of the TCWF 1 is its effectiviness in fighting poverty: households receiving the tax credit are not poor anymore, and no non-poor household will receive the credit (there is, however, an incentive to reduce household labour supply in order to become eligible for the tax credit). The TCWF 2, on the other hand, is also paid to non-poor households, a feature common to all in-work benefits with phase-out rates smaller than 100%. In addition, for very low income households the tax credit may be too small to raise their disposable income to the poverty line. These features are illustrated in Figure 2 which shows the case of a family with the husband working full-time and the wife working 20 hours. Without tax credits this family is located at point g on its budget constraint. The TCWF 1 will increase family income to point d. Reducing or increasing the wife's labour supply (up to point f) will not affect disposable income implying no work incentives for the secondary earner, given the primary earner works full-time. By contrast, the TCWF 2 increases disposable household income up to point e, which is still below the poverty line. In this case changing the wife's labour supply would affect disposable income which can be increased above the poverty line. This is the reason why in the public discussion it is argued that this kind of tax credit makes work pay. Theoretically, however, it is well known that the labour supply effects of the tax credit is unambiguously negative.[12] These negative effects are weaker compared to the TCWF 1, however.

Finally, we also simulate the effects of introducing a mandatory minimum wage of 3000 CHF per month, as demanded by the labour unions. For part-time workers the minimum wage is adjusted correspondingly. This minimum wage has to be paid by employers. Hence the costs we compute are additional labour costs for the employers, not budgetary costs for the government. As stated above, we assume that labour demand is not affected by the minimum wage.

Table 8 summarises the main simulation results. We assume that households have to be full-time employed (i.e. household labour supply must be at least 40 hours per week) in order to receive the tax credit. This is a rather strict requirement which will be relaxed in the next subsection. It is, however, how policy makers and the public appear to perceive the main direction for reform, i.e. it is necessary to help those who do not have sufficient income despite working full-time (only for single parents a smaller work requirement is socially accepted). We measure the success of an instrument by its cost-effectiveness, which is defined as the mean cost per household out of poverty.

The first clear result of the simulations is not surprising: introducing a general minimum wage is very expensive and ineffective in fighting poverty. Poverty among the working population is reduced from 3.5% to 2.9% (and from 2.2% to 1,7% in the full-time working population). Similar results have been found for several other countries (see e.g. Brown, 1999, Neumark and Wascher, 1997, Neumark, Schweitzer, and Wascher, 1999, 2000). Overall costs of introducing the general minimum wage are estimated to be 1'700 million CHF, but only 263 million actually go to poor households. These costs are additional labour costs for the employers. To put these numbers into perspective total expenditure for social assistance have been 2'000 million CHF in 1998 (approximately 0.5% of GDP).

The two tax credit programmes have almost the same costs. However, the TCWF 1 takes all recipients out poverty, whereas the TCWF 2 only about 50%, as can be seen from the poverty rate in the full-time working population. Consequently, the TCWF1 is much more cost-effective in reducing poverty with average costs of about CHF 9'000 per household taken out of poverty. It is instructive to compare this number to the mean poverty gap in the current situation (CHF 6'400) which measures average costs of taking all households out of poverty ignoring any behavioural changes. In other words, the change in labour supply increases average costs by almost a third. This change can only occur in two-adult households given the full-time requirement for receiving the tax credit. This is reflected in the 0.7 percent drop of the female participation rate. This drop is also evident for the TCWF 2 which in theory has less negative labour supply incentives. Given the work requirement of 40 hours only couples have an incentive to adjust labour supply. Almost all changes in labour supply consist of married women stopping to work. This reduction in female labour market participation appears to be small, but considering

[12] In the plateau range the tax credit is like a lump sum transfer which only has a negative income effect. In the

that only roughly 2.5% of the working population are affected by the reform the labour market effect is relatively strong. It implies that about one third of the eligible households reduce their labour supply.

It is a bit unfair to measure the performance of the TCWF 2 only by households out of poverty. The design of the TCWF 2 allows to increase incomes above the poverty line for pre-reform poor households. In addition households with pre-reform income slightly above the poverty line also benefit from the TCWF 2 which increases their income further above the poverty line. About one third of the tax credits goes to households not poor before the reform, and one third goes to households that remain poor after the credit. Hence only the remaining third actually goes to households taken out of poverty. The number of recipient households is twice as large compared to the TCWF 1. Thus the TCWF 2 also has an effect on households at risk of poverty, measured e.g. by having a household income between 100 and 110% of the poverty line. However, it is difficult to quantify this effect, and ultimately it depends on the preferences of society on how much income support for households above the poverty line is valued.

Overall, these results suggest that the TCWF 2 is less cost-effective in reducing poverty compared to TCWF 1. In the next subsections we analyse whether this finding is robust with respect to changes in the hours requirement and changes in the parameters of the TCWF 2.

Reducing the minimum hours requirement to 20 hours

Table 9 displays the simulation results for the two tax credit systems with a minimal hours requirement of 20 hours per week. The main conclusions of the previous subsection are not affected by the reduction of the hours requirement. The TCWF 1 is still superior to the TCWF 2 with respect to cost-effectiviness. Note that overall costs increase by roughly 50% but the effect on poverty is also much larger compared to the previous simulation. Consequently, in both cases there is only a small increase of the costs per household taken out of poverty. The negative effects on labour market participation are somewhat smaller compared to the previous simulation with a 40 hours work requirement, because now some non-working households are encouraged to start working by the tax credit.

Overall, these findings suggest that at least in the present case the amount of work requirement mainly depends on society's preferences regarding how much labour is reasonable in order to

phase-out range the tax credit is like a negative income tax which as negative income and substitution effects.

qualify as working poor and not on cost-effectiveness considerations. Further simulations however clearly show that further reductions of the minimum hours requirement lead to substantial increases of the cost-effectiveness indicator.[13]

Variations of the parameters of TCWF 2

There is only few evidence on the "optimal" design of a tax credit in the spirit of the British WFTC. The parameters for the TCWF 2 (see Table 7) were chosen in order to generate transfers in the same magnitude as the existing social assistance payments. In Table 10 we present simulation results for systematic variations of these parameters. In the first case the maximal transfer is increased by 10%, and in the second case it is reduced by 10%. In the final case the plateau range is extended but the maximal transfer is reduced. The exact parameters are presented in Appendix Table B.2. The first column repeats the results for the TCWF 2 presented in Table 8.

The results of these simulations are rather clear-cut. Increasing the maximal transfer by 10% leads to larger reduction of poverty compared to the base case, but costs are increasing overproportionally leading to a reduced cost-effectiveness. In addition we observe a further reduction of the female participation rate. On the other hand decreasing the maximal transfer implies a smaller reduction of poverty without a similar cut in costs. Hence the costs per household out of poverty are significantly larger compared to the base case. This simulation clearly shows that if success of a income support instrument is measured by households out of poverty the income support must be generous enough to get a significant number of households out of poverty.

Finally, in the third variation we find the same effect on poverty as in the base case but at larger costs. Hence cost-effectiveness is inferior to the base case. Further analysis reveals that although the poverty rate is the same it is not the same households that are taken out of poverty. The base case appears to favour larger households compared to the third variation of the base case. This result indicates that the design of in-work tax credit has an impact on the structure of the remaining poor households.

[13] Available on request.

7. Conclusions

Income support for working low income families (the "working poor") is on top of the political agenda in Switzerland. Labour unions demand a general minimum wage of CHF 3000, whereas the Swiss government promotes in-work benefits to boost incomes. In-work benefits are characterised by conditioning benefit receipt on working at least a specific amount of time. The current social assistance system does not have a work requirement and gives rise to a 100% implicit marginal tax rate for the recipients. This paper provides a microsimulation of the effects of introducing different schemes of in-work benefits in Switzerland. The microsimulation is based on a structural labour supply model estimated separately for one and two-adult households. We simulate two different designs of tax credits for working families (TCWF). The first simply supplements the existing social assistance rules by a minimum working hours requirement. The second TCWF is modelled after the British Working Families Tax Credit. It is characterised by a minimum hours requirement and a tax credit which remains constant up to a specific income threshold. For incomes above this threshold the transfer is phased out at a rate of 70%.

The simulation results indicate that minimum wages are an ineffective and expensive instrument to fight poverty. Among the two versions of the in-work tax credit the first is superior when cost-effectiveness is measured by average cost per household out of poverty. The estimated labour market effects of both designs are estimated to be almost identical. These findings are surprising at first sight because a priori one would expect the second design to be better, at least with respect to the labour market effects. However, conditioning eligibility on full-time employment provides sufficient work incentives, so the difference in the implicit marginal tax rate is not relevant. Reducing the work requirement to 20 hours per week does not change the main conclusion. Further reductions of the hours requirement, however, lead to more negative work incentives of the first design and steeply increasing costs.

The second design of the TCWF affects incomes above the poverty line as well. Poor households can receive tax credits that push their incomes above the poverty line, and even non-poor households may receive tax credits, pushing their income further above the poverty line. These effects can be seen as reducing the poverty risk of these households, but they are neglected by the cost-efficiency measure used in this paper. If the society values these effects the evaluation of the two designs is not as clear-cut as suggested above.

Overall, our simulation results indicate that in-work benefits can be cost-effective in reducing or eliminating poverty among working households. They are relatively easy to administer and will probably lead to much greater take-up rates compared to the current social assistance system. For these reason, we belive that tax credits are a good instrument to support low-income working families. The introduction of in-work tax credits would allow to concentrate social assistance funds on the original purpose of social assistance, which is temporary assistance in case of a financial emergency.

The research can be extended in several directions. There is the question whether the labour supply model with a joint utility function (the unitary model) is adequate. There is evidence that family labour supply should be a analysed in a collective model (c.f. Vermeulen, 2002), in which spouses divide household income according to a sharing rule. However, it appears that the empirical formulation of collective models is not ready for the kind of microsimulation presented in this study (especially the treatment of nonparticipation and children is underdeveloped).

Another important question relates to the interaction of transfer programmes. In the simulations we assumed that all other programmes (especially social assistance) remain unchanged. However, given our design this implies that social assistance is as generous as the tax credit, but without the work requirement. This of course undermines the work requirement so either social assistance should be reformed as well or the tax credit should be made more generous than social assistance. On the other hand, the recipients of tax credits did not receive social assistance before the introduction of the tax credits, so it is unlikely that they would do so when tax credits are introduced. Hence we are confident that our results are reliable estimates of first stage effects of the reforms. Analysing second stage, i.e. general equilibrium effects is left for future research.

References

Besley, T. and S. Coate (1992), "Workfare versus Welfare: Incentive Arguments for Work Requirements in Poverty Alleviation Programs, *American Economic Review* 82, 249-261.

Besley, T. and S. Coate (1995), "The Design of Income Maintenance Programmes", *Review of Economic Studies* 62, 187-221.

Blundell, R., A. Duncan, J. McGrae and C. Meghir (1999), "The Labour Market Impact of the Working Families Tax Credit", mimeo, IFS.

Blundell, R., A. Duncan, J. McGrae and C. Meghir (2000), "The Labour Market Impact of the Working Families Tax Credit", *Fiscal Studies*, 21, 65-74.

Blundell, R. and H. Hoynes (2001), "Has In-Work Benefit reform helped the Labour Market?", NBER Working Paper 8546.

Blundell, R. and T. MaCurdy (1999), "Labor Supply: A Review of Alternative Approaches", in: O. Ashenfelter and D. Card (eds), *Handbook of Labor Economics, Vol 3A*, Elsevier

Brewer, M. (2000), "Comparing In-Work Benefits and Financial Wirk Incentives for Low-Income Families in the US and the UK, Institute for Fiscal Studies Working Paper 00/16.

Brown, C. (1999), «Minimum wages, employment, and the distribution of income», in O.C. Ashenfelter und D. Card (Hrsg.), *Handbook of Labor Economics*, Vol. 3B, Amsterdam: North-Holland, S. 2101–2163.

Duncan, A. and J. MacCrae (1999), "Household Labour Supply, Childcare Costs and In-Work Benefits: modelling the Impact of the Working Family Tax Credit in the UK", mimeo, Department of Economics and Related Studies, University of York.

Duncan, A, and M. Weeks (1998), "Simulating transition probabilities using discrete choice models", *Proceedings of the American Statistical Association*, 106, 151-156.

Eissa, N. and H. Hoynes (1998), "The Earned Income Tax Credit and the Labor Supply of Married Couples", NBER Working Paper 6856.

Hoynes, H. (1996), "Welfare Transfers in Two-Parent Families: Labor Supply and Welfare Participation under AFDC-UP", *Econometrica* 64, 295-332.

Keane, M. and R. Moffitt (1995), " A Structural Model of Multiple Welfare Participation and Labor Supply", *International Economic Review* 39, 553-589.

Leu, R.E., S. Burri und T. Priester (1997), *Lebensqualität und Armut in der Schweiz*, Bern: Haupt (2. edition)

Meyer, B.D. and D.T. Rosenbaum (1999), "Welfare, the Earned Income Tax Credit, and the Labor Supply of Single Mothers", NBER Working Paper 7363.

Neumark, D. und W. Wascher (1997), «Do minimum wages fight poverty?», NBER Working Paper 6127

Neumark, D. and W. Wascher (2000), „Using the EITC to help poor families: New Evidence and a Comparison with the Minimum Wage", NBER Working Paper 7599.

Neumark, D., M. Schweitzer und W. Wascher (1998), «The effects of minimum wages on the distribution of family incomes: a non-parametric analysis», NBER Working Paper 6536

Neumark, D., M. Schweitzer und W. Wascher (2000), «The effects of minimum wages throughout the wage distribution», NBER Working Paper 7519

Saez, E. (2002), "Optimal Income Transfer Programs: Intensive versus Extensive Labor Supply Responses", *Quarterly Journal of Economics* 117, 1039-1073.

Scholz, J.K. und V.J. Hotz (2001), «The Earned Income Tax Credit», NBER Working Paper 8078.

Van Soest, A. (1995), "Structural Models of Family Labour Supply: A Discrete Choice Approach", *Journal of Human Resources* 30, 63-88.

Van Soest, A. and M. Das (2001), "Family Labour Supply and Proposed Tax Reforms in the Netherlands", *De Economist* 149, 191-218.

Vermeulen, F. (2002), "Collective Household Models: Principles and Main Results", *Journal of Economic Surveys*

Tables

Table 1: Poverty Lines and Equivalence Scales

Household Size	SKOS Guideline[a)]	Equivalence Scale	Poverty Line Urban Area[b)]	Poverty Line Nonurban Area [b)]
1	1110	1	1999	1909
2	1700	1.53	2863	2655
3	2070	1.86	3255	3122
4	2385	2.14	3633	3565
5	2660	2.42	4036	3671
6	2940	2.70	4316	3951
7	3225	2.98	4601	4236
8	3505	3.26	4881	4516
9	3785	3.53	5161	4796

a) SKOS: Swiss Conference for Welfare. The figures are the sum of the primary basic needs and the mean of the so called secondary basic needs. All figures in CHF, 1 CHF ≈ 0.68€.

b) Computed as the sum of the guideline in column 2 and median housing expenditure of households with income below median income, separated by household size and region

Table 2: Poverty Rates, Excluding Self-Employed

	All	No Children		Couples with children	Single Parents	More than 2 adults
		Singles	Couples			
				All households		
Poverty Rate	4.9 (98'000) [1]	4.8	2.5	4.9	25.7	2.6
Inequality	126.7	94.4	81.7	65.6	172.9	74.1
				Working		
Poverty Rate	3.5 (69'000) [1]	3.6	1.8	4.6	14.8	2.1
Inequality	109.4	81.3	73.9	61.6	79.3	67.8
				Working at least 20 Hours per Week		
Poverty Rate	2.9 (57'000) [1]	2.5	1.6	4.0	11.8	1.9
Inequality	101.8	71.6	69.3	61.2	77.0	62.6
				Working at least 40 Hours per Week		
Poverty Rate	2.2 (38'000) [1]	1.4	1.3	3.4	7.3	1.4
Inequality	92.1	66.2	65.8	55.9	73.8	59.1

Own calculations based on the SIES 1998. Full Sample: Working age population, neither in education nor retired. Poverty Lines are as in Table 2.1. Disposable income is net of sickness fund premia. All figures have been computed using sampling weights. Inequality is measured with the General Entropy (GE) measure with parameter α set to –1. This measure is sensitive to variations at the bottom of the income distribution

[1] Absolute number of poor households

Table 3: Descriptive Statistics

	Two Adult Households		Single Female Households	Single Male Households
	Husband	Wife		
Participation Rate	98.0	64.1	93.0	95.9
Hours of Work (all)	40.7	17.1	33.5	38.7
Hours of Work (H>=0)	41.5	26.7	36.3	40.3
Age	40.9	38.2	38.9	36.8
Low Education	0.08	0.14	0.10	0.02
High Education	0.38	0.23	0.32	0.40
Foreigner	0.17	0.14	0.10	0.13
Hourly Wage	39.5	29.1	30.7	35.4
Net Household Income (per month)	7835.3		4644.8	5338.4
Number of Children	1.0		0.32	0.04
Children younger than 4	0.22		0.03	0.002
Children between 4 and 5	0.14		0.03	0.00
Children between 6 and 12	0.29		0.11	0.01
Number of observations	3485		1174	831

Note: Own calculations

Table 4: Estimation Results, Two-Adult Households

	Full Model	
	Estimate	Std.Error
Income squared	**-0.83**	0.11
Male Hours x Income	**0.32**	0.07
Female Hours x Income	0.09	0.05
Female Hours Squared	**0.13**	0.01
Female Hours x Male Hours	**-0.16**	0.02
Female Hours	0.03	0.12
x (age-40)	**-0.03**	0.001
x (age-40) squared	**-0.08**	0.02
x **1(**high education male)	0.02	0.04
x **1(**high education female)	**0.32**	0.06
x Number of Children	**-0.37**	0.02
x **1**(Child younger than 4)	**-0.65**	0.04
x **1**(Children between 4 and 5)	**-0.33**	0.05
x **1**(Foreigner)	**0.23**	0.04
Male Hours	**1.41**	0.13
x (age-40)	**-0.01**	0.003
x (age-40) squared	**-0.08**	0.03
x **1(**high education male)	0.06	0.08
x **1(**high education female)	**-0.31**	0.10
x Number of Children	0.01	0.04
x **1**(Child younger than 4)	**-0.42**	0.08
x **1**(Children between 4 and 5)	**-0.30**	0.10
x **1**(Foreigner)	**-0.49**	0.06
Income	**2.98**	0.43
$\sigma_{\beta Y}$	**1.44**	0.17
Log Likelihood	-6242.95	
Sample Size	3485	

Robust standard errors. Simulated Maximum Likelihood with 100 repetitions. Income and Hours are per week, divided by 1000 and 10, respectively.

Table 5: Estimation Results, One-Adult Households

	Single Men		Single Women	
	Estimate	Std.Error	Estimate	Std.Error
Income squared	**-2.00**	0.60	**-2.16**	0.54
Hours x Income	**-0.72**	0.36	**-0.45**	0.22
Hours	0.27	0.33	**0.77**	0.31
x (age-40)	-0.02	0.01	**-0.03**	0.01
x (age-40) squared	**0.23**	0.10	-0.04	0.06
x **1(**high education)	0.08	0.30	0.16	0.19
x Number of Children	0.06	0.38	**-0.58**	0.09
x **1**(Child younger than 4)	-		**-1.26**	0.41
x **1**(Children between 4 and 5)	-		**-0.99**	0.36
x **1**(Foreigner)	-0.30	0.30	0.13	0.24
Income	**21.22**	4.87	**13.21**	1.87
$\sigma_{\beta Y}$	**9.35**	2.17	**6.02**	0.88
Log Likelihood	-385.865		-1344.675	
Sample Size	831		1174	

Robust standard errors. Simulated Maximum Likelihood with 100 repetitions. Income and Hours are per week, divided by 1000 and 10, respectively.

Table 6: Simulated Wage and Income Elasticities for Households with equivalent income less than median equivalent income

	Single Women	Single Men	Women in Couples	Men in Couples
10% increase of male wages				
Hours Elasticity		0.02	-0.43	0.03
Participation Elasticity		0.001	-0.26	0.01
10% increase of female wages				
Hours Elasticity	0.07		0.56	-0.01
Participation Elasticity	0.01		0.36	-0.003
10% increase of nonlabour income				
Hours Elasticity	-0.04	-0.001	-0.06	-0.001
Participation Elasticity	-0.01	-0.0003	-0.04	-0.000

Simulated elasticities based on parameter estimates in Tables 4 and 5.

Table 7: Parameter of the TCWF 2

Household Size	Maximal Transfer (= SKOS-Basic Needs I + II)	Plateau-End
1	1110	800
2	1700	1000
3	2070	1000
4	2375	1000
5	2660	1000
6	2940	1000
7	3225	1000
8	3505	1000

Table 8: Simulated Effects of the Programmes with 40 Hours Work Requirement

	Current Situation	**General Minimum Wage of CHF 3000**	**Tax Credit for Working Families 1 (TCWF 1)**	**Tax Credit for Working Families 2 (TCWF 2)**
Poverty Rate (in %)[1]	3.5	2.9	1.4	2.5
	(2.2)	(1.7)	(0.0)	(1.0)
Mean Poverty Gap per year	7250	6600	8300	6000
(in CHF)[1]	(6'400)	(4'900)	(0)	(2'700)
Total Costs of Programme per year[2]		1'700	360	370
(in Mio. CHF.)		(263)[3]		
Mean Costs per Household out of		216'000	9000	19'000
Poverty per year (in CHF)		(33'000)[3]		
Δ Labour Market Participation in %				
Men		0	0	0
Women		0	-0.7	-0.7

Source: EVE 98, own calculations.

1 Poverty rate and poverty gap in working population (in full-time working population)

2 Cost for minimum wages are gross costs for the employers.

3 The figures in parantheses refer to poor full-time working households. Approximately 100 Million CHF go to poor households working less than 40 hours per week.

Table 9: Simulated Effects of TCWF with 20 Hours Work Requirement

	Current Situation	**Tax Credit for Working Families 1 (TCWF 1)**	**Tax Credit for Working Families 2 (TCWF 2)**
Poverty Rate (in %)[1]	3.5	0.6	1.9
	(2.9)	(0.0)	(1.3)
Mean Poverty Gap per year	7250	9800	4400
(in CHF.)[1]	(6'600)	(0)	(2'700)
Total Costs of Programme per year (in Mio. CHF.)		559	605
Mean Costs per Household out of Poverty per year (in CHF)		10'000	20'000
Δ Labour Market Participation in %			
Men	0	0	0
Women	0	-0.4	-0.5

Source: EVE 98, own calculations.
1 Poverty rate and poverty gap in working population (in population working at least 20 hours)

Table 10: Simulation results for alternative designs of TCWF 2

	TCWF 2	**1**: Increase of maximal transfer by 10%	**2**: Decrease of maximal transfer by 10%	**3**: Extension of plateau range and decrease of maximal transfer
Poverty Rate (in %)[1]	1.0	0.4	1.5	1.0
Mean Poverty Gap per year (in CHF)[1]	2'700	2'000	2'800	3'100
Total Costs of Programme per year (in Mio. CHF.)	370	669	285	449
Mean Costs per Household out of Poverty per year (in CHF)	19'000	22'000	25'000	23'000
Δ Labour Market Participation in %				
Men	0	0	0	0
Women	0.7	-1.1	-0.5	-0.5

Source: EVE 98, own calculations.
See Table A.1 for details regarding the parameters chosen for this simulation
1 In full-time working population

Figures

Figure 1: Distribution of Hours Worked

Figure 1a: Single men

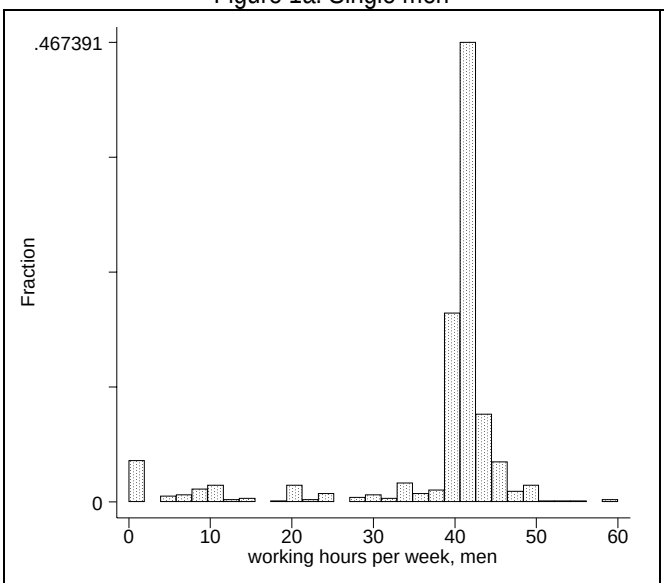


Figure 1a: Single women

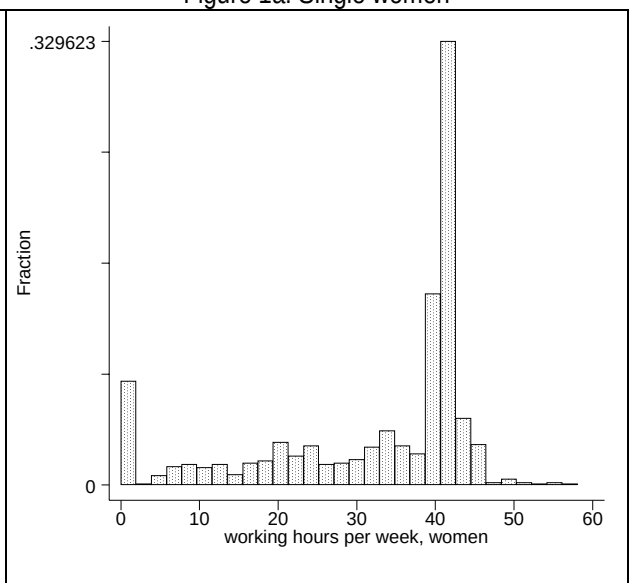


Figure 1c: Men in Couples

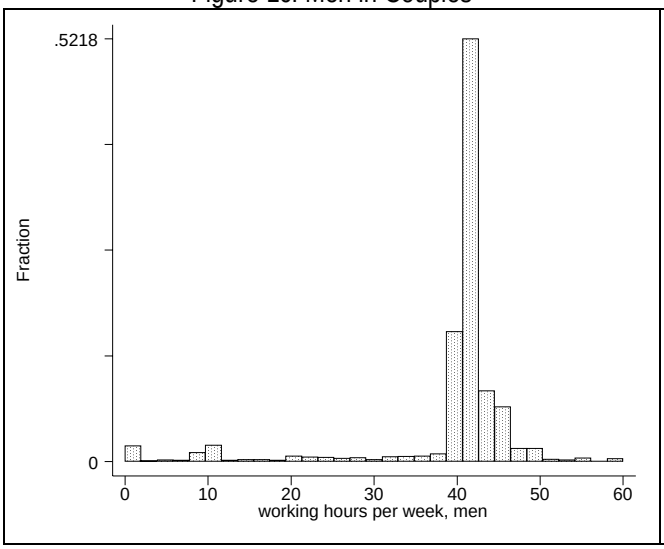
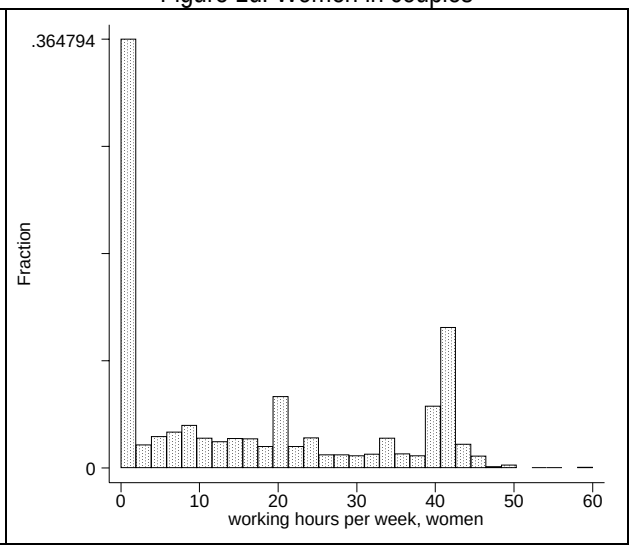
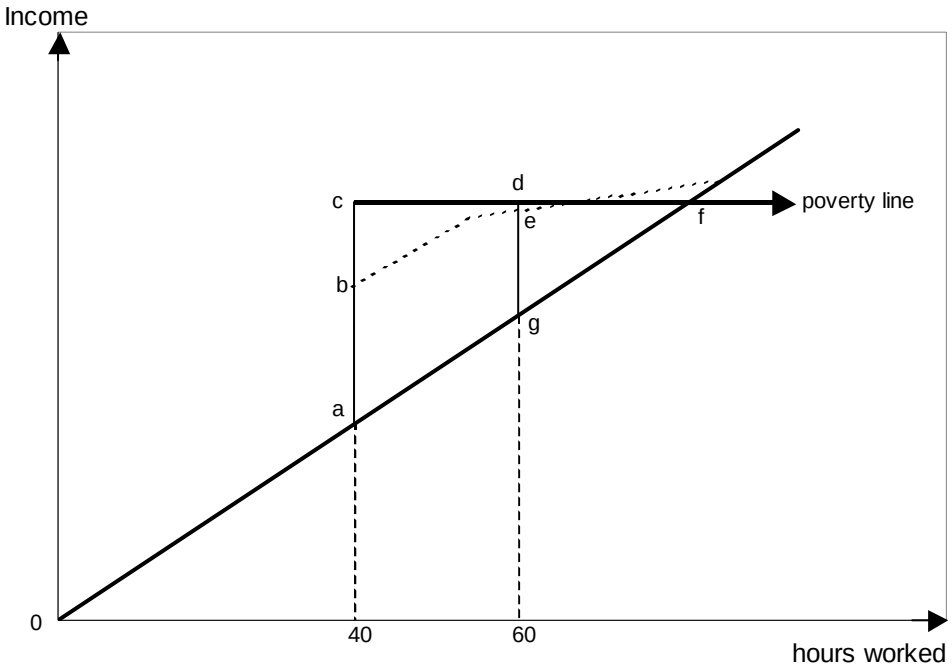


Figure 1d: Women in couples



Note: Own calculations based on the SIES data.

Figure 2: Illustration of the two Tax Credits for Working Families



Appendix A: Brief Description of extisting in-work benefit systems in the USA and UK

Earned Income Tax Credit: The Earned Income Tax Credit began in 1975 as a modest program aimed at offsetting the social security payroll tax for low-income families with children. As discussed more below, the generosity of the EITC increased in tax acts of 1986, 1990, and 1993. The contrasts between the EITC and traditional welfare benefits are many. First, the EITC is provided through the tax system rather than the welfare system. Second, eligibility for the EITC is available to all low-income families with children, independent of marital status. Third, receipt of the credit requires positive family earnings. Consequently, the EITC creates positive incentives to work for single parent families. Because the credit is based on family earnings, however, the credit can create adverse incentives to work among married couples.

Eligibility for the EITC depends on the taxpayer's earned income (or in some cases adjusted gross income), and the number of qualifying children who meet certain age, relationship and residency tests. The amount of the credit to which a taxpayer is entitled depends on the taxpayer's earned income, adjusted gross income, and, since 1991, the number of EITC-eligible children in the household. There are three regions in the credit schedule. The initial phase-in region transfers an amount equal to the subsidy rate times their earnings. In the flat region, the family receives the maximum credit. In the phase-out region, the credit is phased out at some phase-out rate.

Working Family Tax Credit (WFTC): Introduced in 1988, the Family Credit was an extension of FIS and was designed to increase generosity and remove tax rates in excess of 100%. It achieved the later objective by fully integrating the in-work credit with the rest of the tax and benefit system. An unusual feature of the Family Credit system, retained from the FIS, was the minimum weekly hours eligibility criterion. At its introduction this was set at 24 hours but then reduced to 16 in April 1992 to encourage part-time work by lone parents with young children. FIS had a minimum hours criteria set at 30 hours for workers in couples and 24 hours for single parents. To partially offset any adverse incentive effects for full time work from these lower hours eligibility levels, a further supplementary credit at 30 hours per week was introduced in April 1995. In the FC system each eligible family was paid a credit up to a maximum amount that depends on the number of children. Eligibility depended on family net income being lower than some threshold (£79.00 per week in 1998-99). As incomes rose the credit was withdrawn at a rate of 70%.

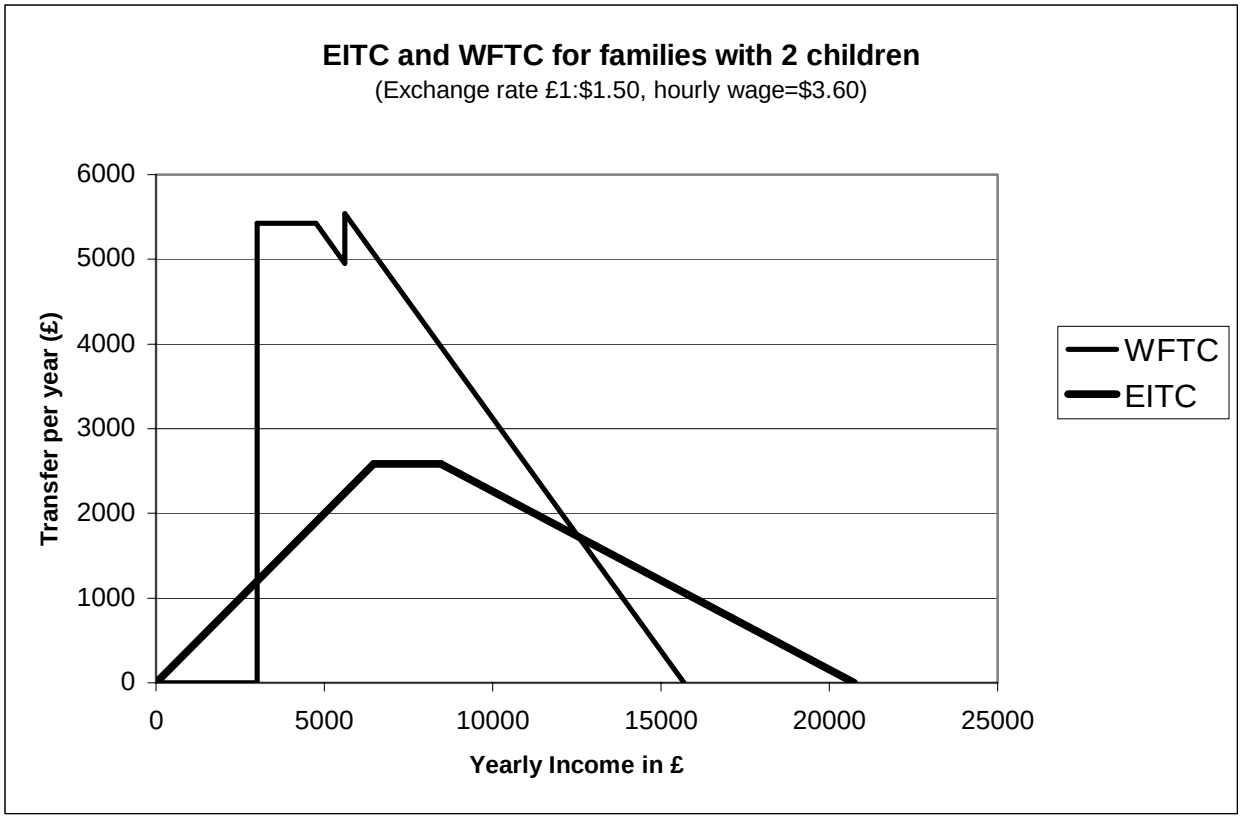
The replacement of FC – the WFTC – was substantially more generous and was fully phased in from April 2000. It increased the level of in-work support relative to the FC system in four ways: by enhancing the credit for younger children; by increasing the threshold; by reducing the benefit reduction rate from 70% to 55%; and by incorporating a new childcare credit of 70% of actual childcare costs up to a quite generous limit.

Figure A.1 displays the amount of EITC and WFTC for a family with two children. It is obvious that the WFTC is more generous than the EITC at lower incomes (if the family is eligible, i.e. works more than 16 hours per week). On the other hand, more people benefit from the EITC. Obviously, the EITC also creates smaller work disincentives in phase-out region than the WFTC. But this is also a problem of the EITC. The EITC is a rather expensive instrument, and more than 50% of those receiving the EITC are not poor.

The empirical evidence on the labour market effects of the EITC are rather clear-cut and summarised in Scholz and Hotz (2001). For one-adult households an increase in the labour market participation rate of 2–3 percentage points is estimated.. This corresponds to an elasticity of about 1. Meyer und Rosenbaum (1999) estimate that about 63% of the increase in the labour market participation rate of lone mothers between 1984 and 1996 can attributed to the EITC. At the same time the empirical evidence clearly indicates the negative effects of the EITC on the labour market participation of spouses and on the working hours of those already employed. Eissa and Hoynes (1998) estimate a reduction of about 1.2 percentage points of the participation rate of married women. Labour supply of husbands decreases by about 2 percent, whereas wives' labour decreases by 1 to 6 percent, depending on the region of the EITC in which the household is without the wife's income. The strongest effects are found in the phase-out region.

The simulation results in Blundell et al (2000) indicate modest labour supply effects of the British WFTC. Ex post analyses are not available at the moment.

Figure A.1: EITC and WFTC for families with two children



Based on Table 3.2 of Blundell and Hoynes (2001).

Appendix B: Tables

Table B.1: Wage regression (dependent variable: log of hourly wage)

	Men		Women	
Variable	Coefficient	Standard Error	Coefficient	Standard Error
Intercept	0.9674	0.3324	0.5158	0.3971
Age	0.1336	0.0253	0.1779	0.0324
Age Squared/100	-0.25	0.06	-0.41	0.08
Age Cubed/1000	0.012	0.005	0.009	0.003
Secondary Level I	0.1879	0.0253	0.2348	0.0249
Secondary Level II	0.3669	0.0335	0.4755	0.0297
Tertiary Level	0.4734	0.0261	0.5362	0.0311
Education unknown	0.3596	0.0956	0.1277	0.1178
Region Lemanique	0.0548	0.0191	0.0661	0.0233
Zurich	0.1125	0.0189	0.1080	0.0232
Northwest	0.0954	0.0195	0.0941	0.0245
East	0.0488	0.0202	0.0308	0.0261
Central	0.0082	0.0228	0.0394	0.0288
Ticino	-0.0079	0.0251	-0.0767	0.0336
Urban	0.0322	0.0132	0.0406	0.0169
Foreigner	-0.1358	0.0172	-0.0804	0.0220
Selection Correction	-		0.054	0.018
R squared	0.36		0.21	
Number of observations	4799		3741	

The selection equation for women included number of children and nonlabour income as additional variables.

Table B.2: Variations of the TCWF2 Parameters

	Unchanged Plateau Range; Variations of maximum transfer			Longer Plateau Range, Decrease of Maximum Transfer	
		1	2	3	
Family Size	End Plateau	Increase of maximum transfer by 10%	Decrease of maximum transfer by 10%	End Plateau	Maximum Transfer
1	800	1221	999	1800	800
2	1000	1870	1530	1800	1224
3	1000	2277	1863	1800	1488
4	1000	2612.5	2137.5	1800	1712
5	1000	2926	2394	1800	1936
6	1000	3234	2646	1800	2160
7	1000	3547.5	2902.5	1800	2384
8	1000	3855.5	3154.5	1800	2608
9	1000	4163.5	3406.5	1800	2824